WINCOMM Project Overview

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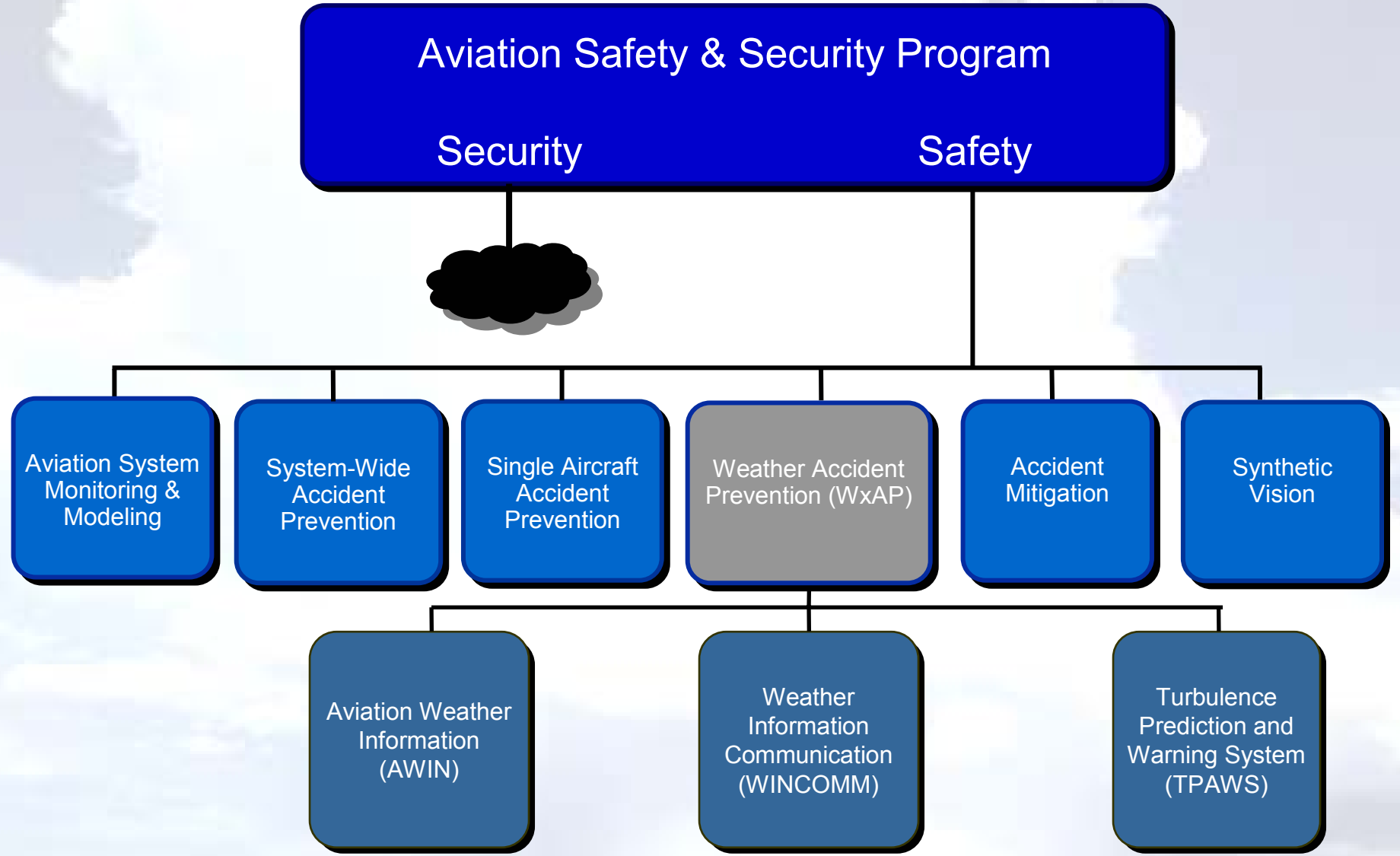
Organization

WxAP: Weather Information Communications



WINCOMM Goals

WxAP: Weather Information Communications

Air

Weather Hazard EPIREPS ⟷ **Weather Hazard EPIREPS**

Tactical Information

Strategic Information

Air

Cockpit Presentation & Decision Aids

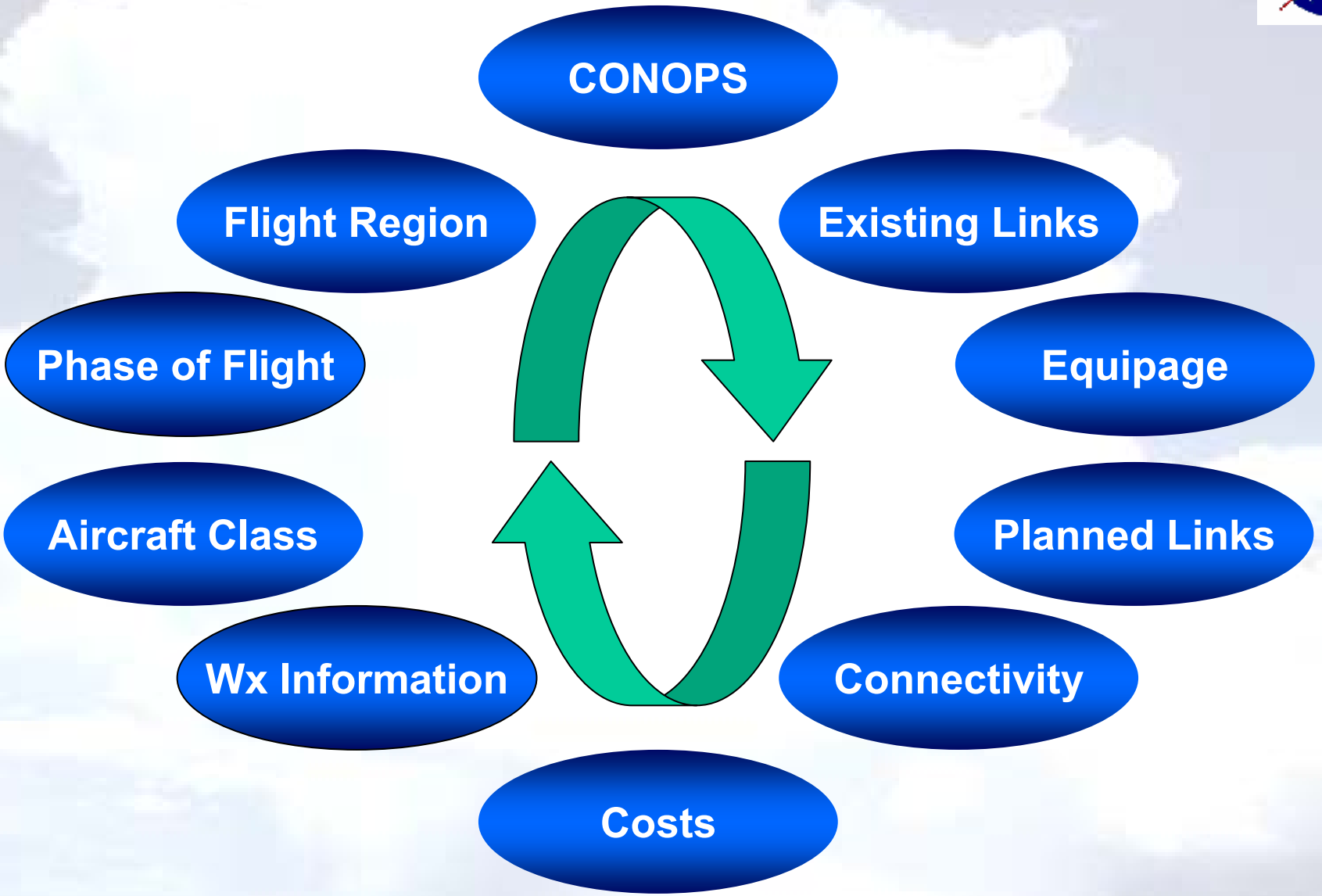
Airborne Weather Sensor Information

Ground

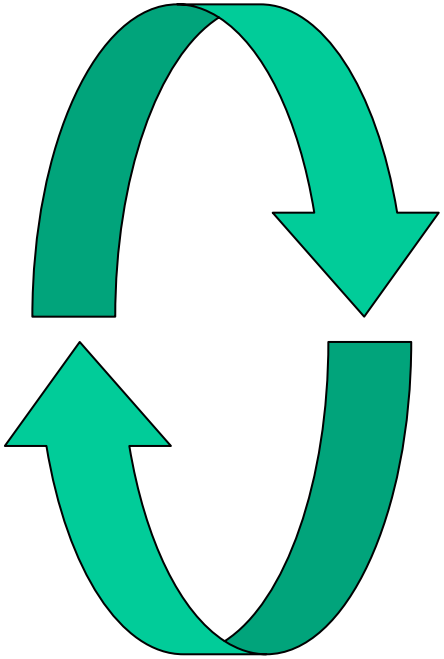
Aviation Wx Information

Forecasters & Weather Product Developers

Data Link Decision Factors



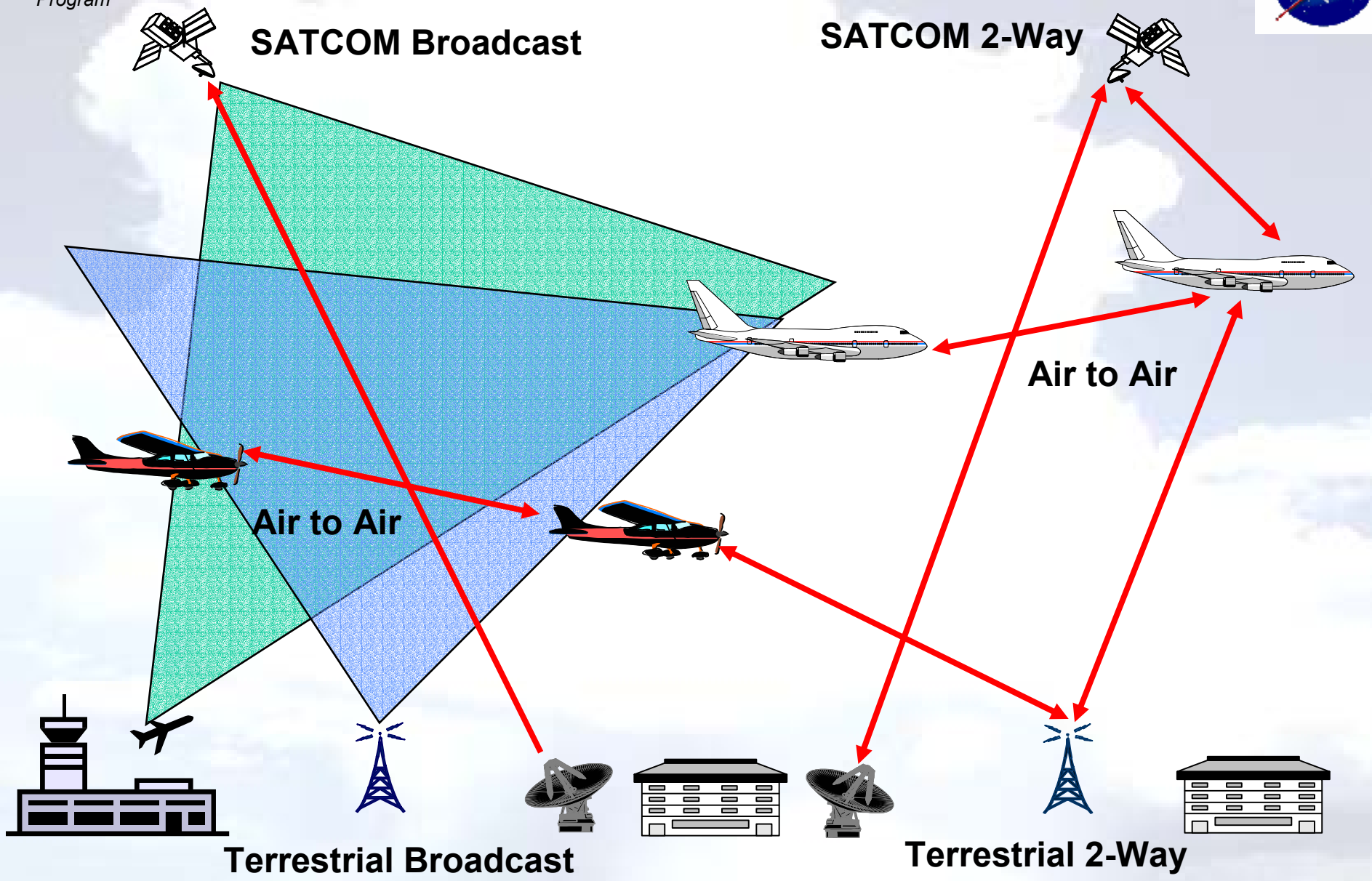
Data Link Decision Factors



Datalink Architectures

(weather information dissemination)

WxAP: Weather Information Communications



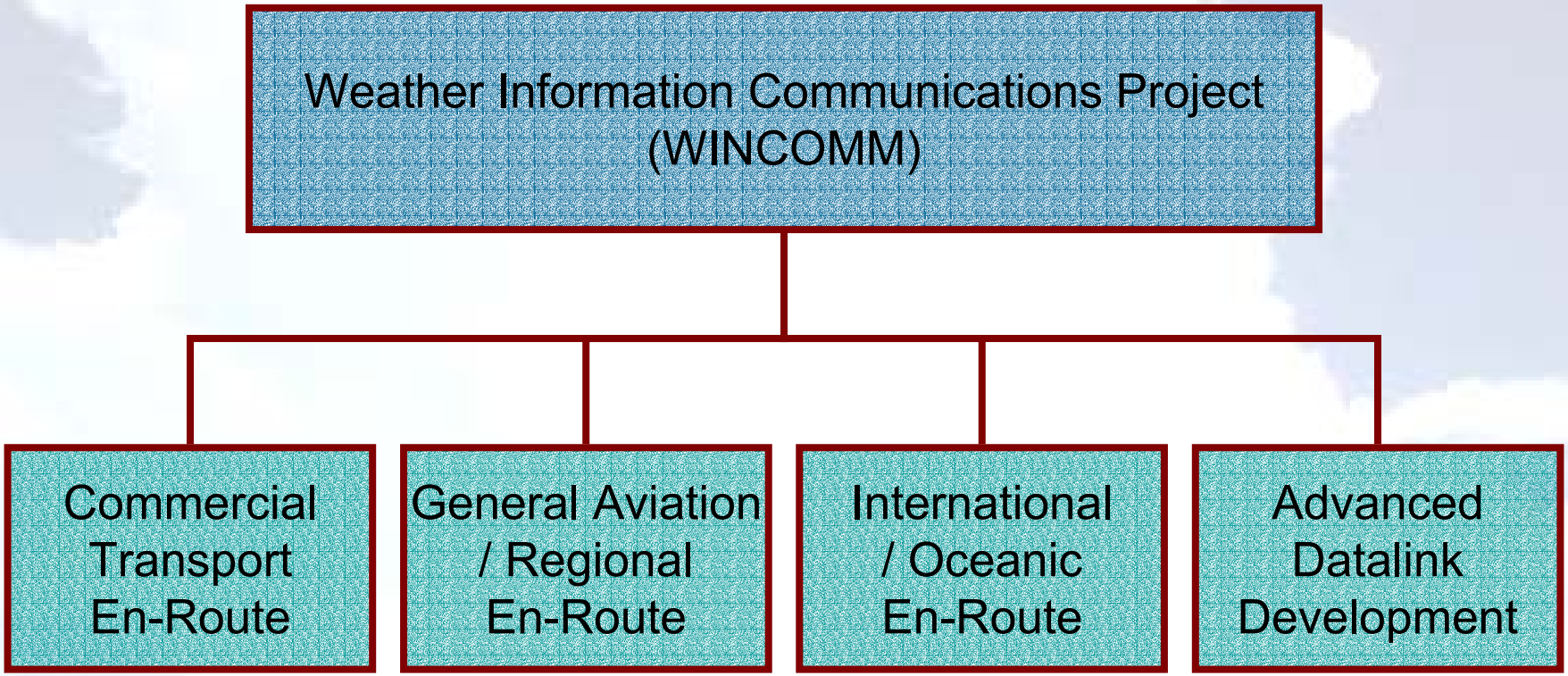
Datalink Validation Goals

- Perform Successful Transmission and Reception of Wx Information
- Show Wx Information flow does not impact “Normal” Traffic
- Demonstrate Feasibility of Operational Implementation
- Lay Foundation for Future Data Link Development

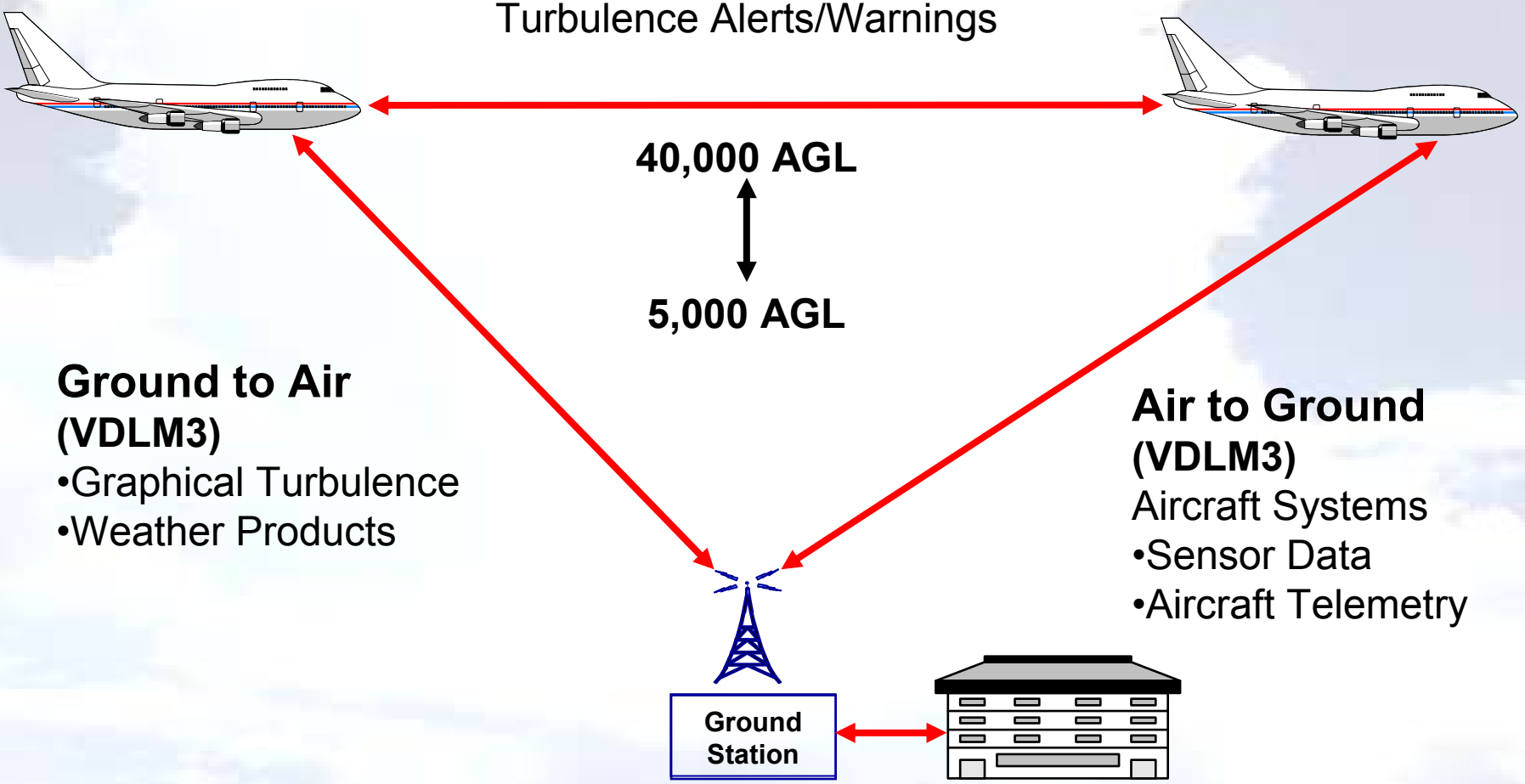
Product Deliverables

- National Capability for Commercial Transport Weather Dissemination
- National Capability for GA/Regional Weather Dissemination
- Global Capability for Weather Dissemination
- Advanced Data Link Technology Candidates for Weather Dissemination

WINCOMM Structure



Commercial Transport En-Route



Regional/General Aviation En-Route

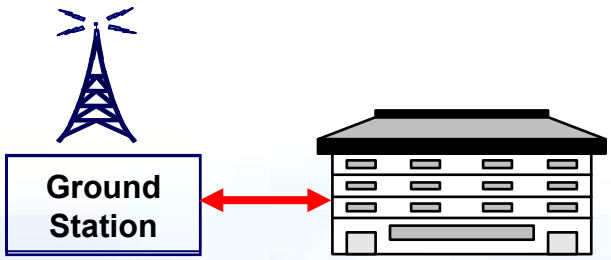
Air to Air
- Atmospheric Sensor Data
- Aircraft Telemetry

40,000 AGL

5,000 AGL

Ground to Air
- Graphical Wx Products
- Textual Wx Products

Air to Ground
- Atmospheric Sensor Data
- Aircraft Telemetry



FAA – UAT Ground Stations & Network

International/Oceanic En-Route

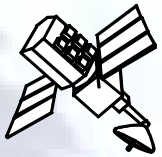
Aviation Safety & Security Program

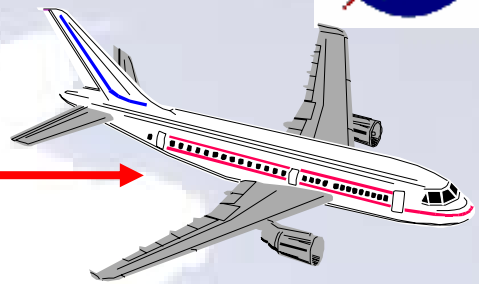
WxAP: Weather Information Communications

Air to Air

(Air-Ground-Air Routing)

•Turbulence Alerts/Warnings



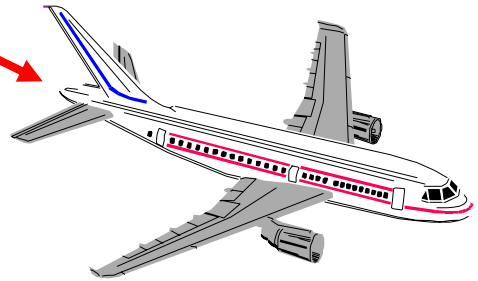


Air to Ground

Aircraft Systems

•Sensor Data

•Aircraft Telemetry

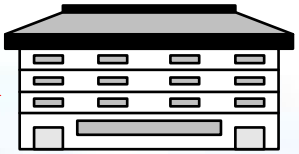


Ground to Air

Ground Systems

•Reports & Forecasts

•Alerts / Warnings



National/Commercial Weather Providers

AOC, Dispatch, ATC

SITA – Inmarsat Swift 64 & Network Service Provider

Advanced Data Link Technologies

- Aviation Cellular
  - Investigation of 4G and 5G cellular systems leading to the development of a Proof-of-Concept (POC) aviation cellular system data link solution utilizing existing public infrastructure (Briefing at WxAP Annual Review – Las Vegas, NV on June 2nd , 2004)
- Reconfigurable Antenna (Honeywell – ESCAN)
  - A Proof of Concept reconfigurable aero antenna spanning 800 MHz to 2.6 GHz will be developed
- Radio on a Chip (Honeywell – ASIC)
  - Size and cost reduction enabling compact radio designs with capability and flexibility through programmability to all VHF aviation NAV/COMM bands

Weather Information Datalinks

Where we are.

POLICIES COST LEGACY

STOVEPIPING Technology

Where we need to be.

Enabling Role of Datalinks

Datalinks: the Critical Gear in the Information Sharing Process

- Safety
- Security
- Capacity
- Efficiency

Total System Solutions Required

Weather Information

+

Delivery to Key Decision Makers

- **Forecasters**
- **Controllers**
- **Pilots**
- **Automated Control Systems**

+

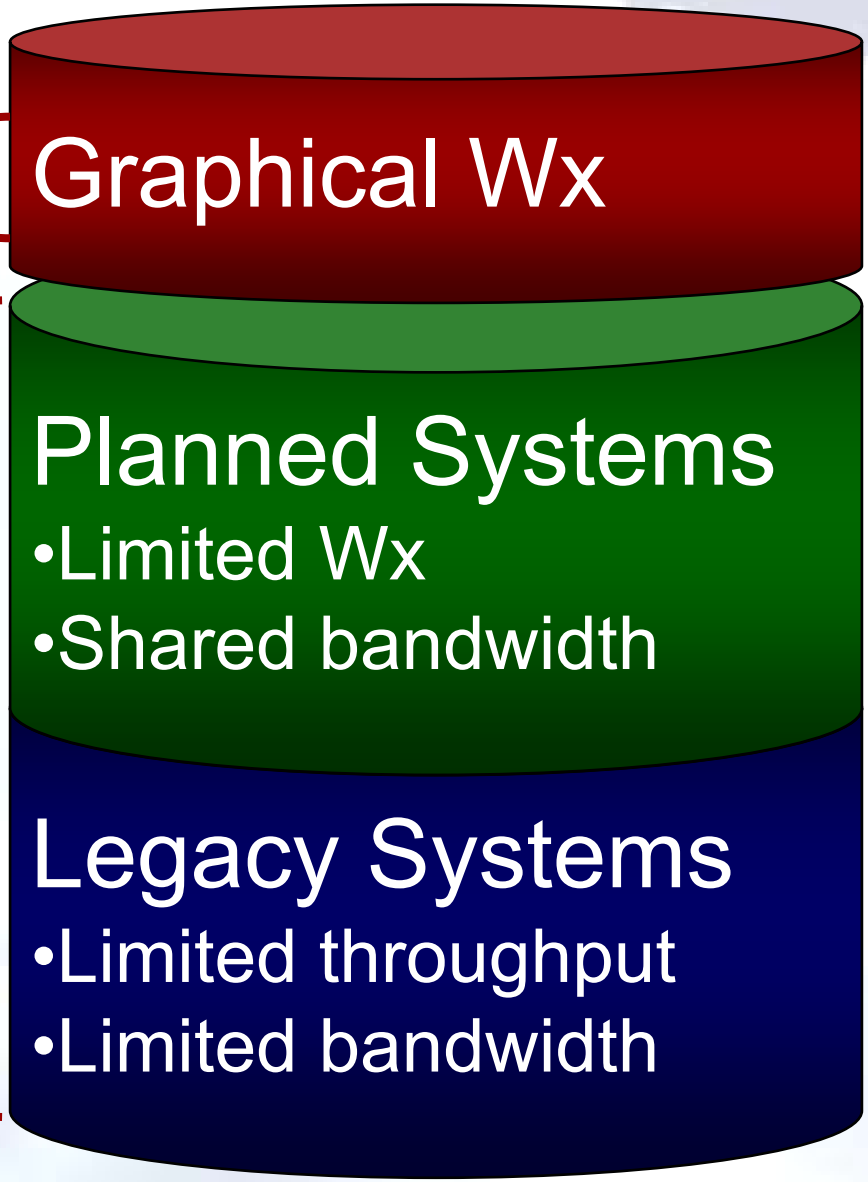
Resultant Action

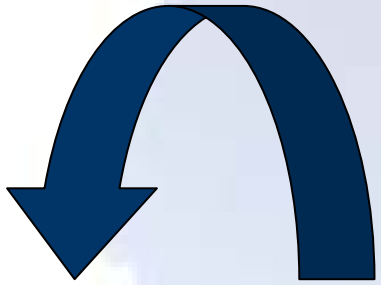
Safety Benefit

Aviation Data Link Capacity

Limited Use of Commercial Spectrum

Assigned FAA Spectrum

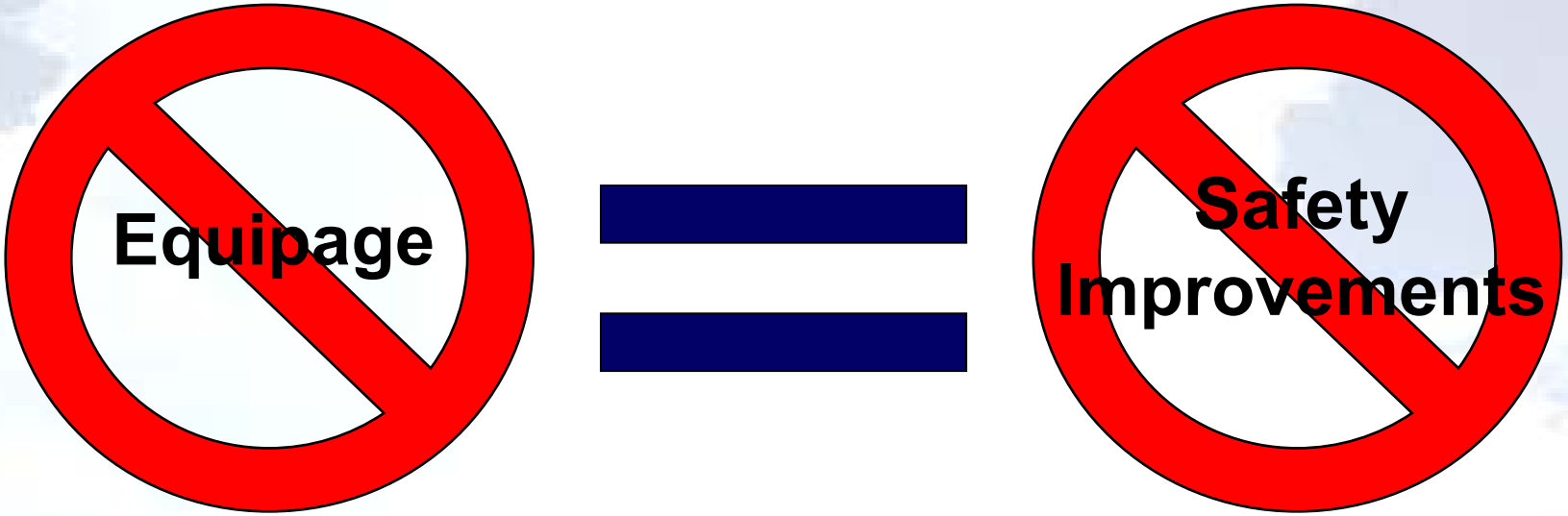




Reallocation

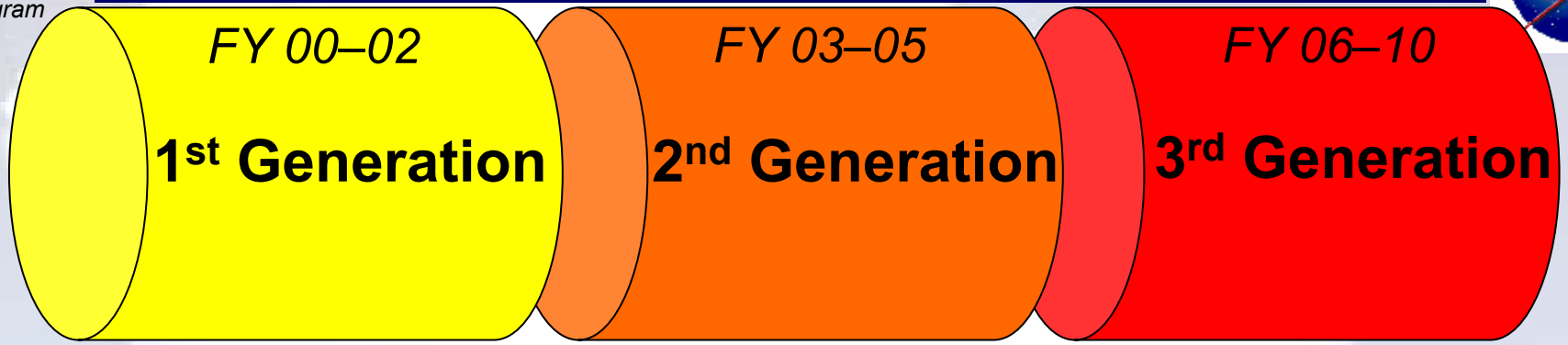
Aviation Data Link Cost

Aviation Data Link Cost



Aviation Data Link Development

WxAP: Weather Information Communications



1st Generation	2nd Generation	3rd Generation
•G–A Broadcast •Private Networks •Weather (Wx) Only •Limited Capacity •High Relative Cost •GA	•G–A, A–G, A–A •Private Networks •Multi-Aviation Use •Additional Capacity •Increased Value •GA & Com Transport •EPIREPS •A/C Wx Sensors •Dynamic Requests	•Full Mesh Networking •Public Infrastructure •Information Pipeline •Broadband •Low Relative Cost •All Aircraft •Crosslinks •Data Processing •Routing
•FISDL (Terrestrial) •WSI (Satcom) •XM (Satcom DARS)	•UAT & VDLM3 (Terrestrial) •Swift 64 (Satcom) •1090ES (Air-Air)	•Aviation Cellular •High-Value Satcom

About Those Great Visions…

A vision without a plan may be a hallucination.